17. (New) The system set forth in claim 12 wherein the camera is positioned in the furnace to observe the movement of convection currents in the glass melt.

18. (New) The system set forth in claim 12 wherein the camera is positioned in the furnace to observe the operation of bubblers in the furnace.

REMARKS

Claims 10-18 are now pending in this application.

The Office Action, and prior art relied upon, have been carefully considered. In an effort to expedite the prosecution of the present application, the specification has been reviewed and a number of informalities have been corrected. In addition, original claims 1-9 have been cancelled and, in their stead, claims 10-18 have been added. These claims are believed to be free of vague and indefinite language so that further rejection of these claims under 35 U.S.C. § 112, ¶ 2, is not anticipated.

Claims 1-3 and 9 have been rejected under 35 U.S.C. § 102(b), as being anticipated by Aoki (U.S. Patent No. 5,272,621); and claims 4 and 6-8 have been rejected under 35 U.S.C. § 103(a), as being unpatentable over Aoki in view of Santos-Victor ("A Computer Vision System...," IEEE Transactions on Industry Applications); and claims 5 and 8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Aoki in view of Miller (U.S. Patent No. 4,409,012).

The following discussion pertains to the patentable distinctions of the present invention as compared to the cited prior art.

Independent claim 10 sets forth a glass melting control system which involves a plurality of inputs from sensors that detect operating conditions in a furnace. Another input involves images taken inside the furnace and analysis thereof in accordance with a mathematical model. Further, a predictive network is provided for inputting data, the predictive network defining various set point values assigned to furnace actuators. These set points correspond to current manual operation wherein an operator would

turn on a particular actuator at a defined set point or threshold. A fuzzy logic controller runs an algorithm that accepts data from the foregoing inputs and the controller generates output signals for actuators and control devices that control the melting operation in a furnace. Thus, there is automation of the actuators and control devices that is currently being done manually in conventional systems.

Fig. 2 illustrates, in block diagram form, the essence of the invention as claimed in independent claim 10. It is important to note that the fuzzy logic controller accepts multiple inputs and provides multiple outputs to corresponding actuators during furnace operation. This combination of structure is quite distinct from the cited prior art.

AOKI

The Aoki reference is directed to a method for controlling a process having dead time. As indicated in the Abstract of the patent, fuzzy interference estimates a variation in process response output during lapse of a dead time on the basis of the value of an input-evaluating criterion. The process is subjected to fuzzy PI (proportional and integral) control based on the estimated value. Thus, viewing the two embodiments of Figs. 7 and 8, it will be noted that data is provided only at a single input representing prior information. Fuzzy logic then compares this single input prior information to certain target values.

As will be appreciated, Aoki is totally void of the multiple inputs upon which the fuzzy logic control algorithm operates as set forth in claim 10 of the present invention. Accordingly, a rejection of this claim under 35 U.S.C. § 102(b) is inappropriate.

Anticipation requires the disclosure, in a prior art reference, of each and every limitation as set forth in the claims. *Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir. 1985); *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir. 1986); *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir. 1986). There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. § 102. *Scripps Clinic*

and Research Foundation v. Genetech, Inc., 18 USPQ2d 1001 (Fed. Cir. 1991); *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (Fed. Cir. 1984).

SANTOS-VICTOR - IEEE TRANSACTIONS PUBLICATION

The reference to Santos-Victor describes a video system that analyzes flames for monitoring purposes but primarily to optimize control of a furnace. Page 473 of the reference discusses the utilization of a neural network classifier with the end result that Santos-Victor performs analysis and optimization of the flames in a furnace. In the presently claimed invention, images are taken inside a furnace and subjected to a mathematical model. The results from corresponding modelling is an information input for the fuzzy control algorithm that may affect one or more actuators of the furnace. In other words, simply employing a flame classifier, such as in Santos-Victor, would not achieve the results of the present invention.

MILLER

The Miller reference deals with a video monitoring of batch material floating on a pool of glass melt. A video signal is processed to generate a histogram that relates pixel signals to relative light intensity. Areas defined by the histogram above and below a threshold provide a reasonable estimate of batch mass and melt present in a viewed region (see Abstract). As in the case of the Santos-Victor reference, Miller provides a video monitoring system for a specific purpose that is not employed in the invention. Otherwise stated, utilization of histogram data does not form an information input to a fuzzy logic algorithm for controlling furnace actuators, as is the case with the present invention.

Dependent claims 11-18 set forth various specifics for the structure of the present invention and these specifics, when taken into consideration with those of the parent claim, renders the dependent claims allowable.

In conclusion, applicant believes that the Examiner has not presented a *prima facie* case that the specific limitations of the claimed invention are met by the applied references. All that the Examiner has provided is the bare allegation that the individually cited prior art reference can be modified to render the invention obvious. It has been long established that the mere fact that a prior art reference can be modified does not make the particular modification obvious unless the prior art suggests the desirability of such a modification. The Examiner is required to demonstrate some logical reason apparent from positive, concrete evidence of record which justifies a rejection under 35 U.S.C. § 103. Obviousness cannot be established absent some teaching, suggestion, or incentive supporting a modification of the prior art so as to meet specific limitations of a rejected claim. See *In re Laskowski*, 871 F.2d 115, 117 (CAFC 1989).

Reconsideration of the application, and favorable Action thereon, are courteously solicited.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees, to Deposit Account No. 22-0185.

Respectfully submitted,

Morris Liss, Reg. No. 24,510
Connolly Bove Lodge & Hutz LLP
1990 M Street, N.W.
Washington, D.C. 20036-3425
Telephone: 202-331-7111

Date: 8/29/01